



**THE GLOBE PROGRAM**

## **Student Climate Research Campaign**

### **Great Global Investigation of Climate Intensive Observing Period**



## **Teacher Participation Guide**

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## Purpose

To involve students in short-term and long-term scientific studies focused on the relationship of temperature and precipitation with climate near their school and in comparisons with schools across the globe as a contribution to scientific research.

## Overview

This global investigation will focus on defining local climate through GLOBE protocols and the student inquiry question “What is my climate and how has it changed?” Students are asked to collect and enter temperature and precipitation data in the GLOBE database and investigate how to classify local weather and climate using these atmospheric data.

## Great Global Investigation of Climate Intensive Observing Periods (IOPs)

While temperature and precipitation measurements can and should be taken and uploaded at any time throughout the year, seasonal changes of temperature and precipitation can be seen by focusing on the months associated with equinoxes and solstices. While changes can be seen, the specific seasonal changes will vary across latitude and continents depending on factors such as climate variability, proximity to water, elevation, topography, and other conditions like drought or impacts due to extreme events. To enable schools to participate during periods with the most representative seasonal fluctuations in temperature and precipitation are captured while allowing for maximum participation to occur, the following focused intensive observing periods (IOPs) for The Great Global Investigation of Climate have been designated, beginning September 2011:

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Great Global Investigation of Climate											

## What is needed

In order to participate in the Great Global Investigation of Climate IOP, you will need the following materials:

- Installed rain gauge
- Snowboard
- A meter stick
- A straight-sided container
- A container for the snowpack-rain equivalent sample
- Something flat and clean to slide under inverted containers
- Digital multi-day max/min thermometer or max/min thermometer
- Atmosphere Investigation Data Sheet

- Clipboard
- Pencil or pen

## Time needed to participate

- Identify and establish a new atmospheric study site and report data: *1 – 2 class periods*
- Conduct repeat observation of an established atmospheric site and report data: *30 minutes*

## What to do and how to do it

### Collect air temperature and precipitation data

1. Identify and establish a representative atmospheric study site, if your school has not previously established a study site. Refer to the Site Selection and Set-up guide (<http://classic.globe.gov/tctg/atinst.pdf?sectionId=7&lang=EN>) for information regarding identification and establishment of an atmosphere site.
2. Follow the Rainfall Protocol (<http://classic.globe.gov/tctg/precip.pdf?sectionId=12&lang=EN>) or Solid Precipitation Protocol (<http://classic.globe.gov/tctg/precip.pdf?sectionId=12&lang=EN>) directions for collecting atmospheric data and record data on the Atmosphere Investigation Data Sheet ([http://classic.globe.gov/tctg/atmo\\_ds\\_integrate1.pdf?sectionId=289&lang=EN](http://classic.globe.gov/tctg/atmo_ds_integrate1.pdf?sectionId=289&lang=EN)).
3. Follow the Max/Min/Current Air Temperature Protocol (<http://classic.globe.gov/tctg/maxmin.pdf?sectionId=13&lang=EN>) or Digital Multi-Day Max/Min/Current Air and Soil Temperature Protocol ([http://classic.globe.gov/tctg/digmulti\\_maxmin.pdf?sectionId=14&lang=EN](http://classic.globe.gov/tctg/digmulti_maxmin.pdf?sectionId=14&lang=EN)) directions for collecting atmospheric data, depending on your instrumentation, and record data on the Atmosphere Investigation Data Sheet ([http://classic.globe.gov/tctg/atmo\\_ds\\_integrate1.pdf?sectionId=289&lang=EN](http://classic.globe.gov/tctg/atmo_ds_integrate1.pdf?sectionId=289&lang=EN)).

### Report data to the GLOBE database

1. Sign In ([http://globe.gov/signin?return\\_to=%2F](http://globe.gov/signin?return_to=%2F)) using your school's Classic ID and Password.
2. Navigate to the GLOBE Data Entry portal (<http://classic.globe.gov/fsl/DATA/G2/MainDisplay.opl?lang=en>).
3. Mouse over the "Atmosphere/Climate" tab and select the "Define an Atmospheric Study Site" data entry page.
4. Select either "Define a New Site" or an existing site from the list of existing sites for your school.
5. Fill in the data form as directed and select "Send Data".

## Optional Extensions

### Related Learning Activities

#### From weather to climate

Students will look at air temperature data starting from individual measurements taken during the course of a day to averages over daily, monthly, and annual time periods. These lead to questions about variations and trends in the data. Extensions provide the foundations to explore additional statistical analysis techniques and spatial averaging.

#### Exploring climate influences

Students examine the characteristics of the earth's climate zones by analyzing 30 years of monthly temperature and precipitation patterns in cities around the world. In their investigation, students observe temperature and precipitation patterns associated with changes in latitude, elevation, proximity to water and physical features.

#### What is your climate classification?

Students will be introduced to the idea that climates can be broadly classified using a system that is based upon long-term averages of specific variables (air temperature and precipitation) by examining the relationship between temperature and precipitation data to determine the Köppen-Geiger climate classification for a specific location.

### Additional Activities

#### GLOBE Soil and Soil Temperature Protocols

In this extension, students will examine the GLOBE soil protocols to answer some key questions that connect soil and climate. Some key questions include:

- How would soil temperature change as climate changes? Why is this important?
- How does this relate to air temperature and the water cycle?

Protocols needed:

1. GLOBE Soil Protocol
2. Soil Temperature Protocol

#### GLOBE Cloud Protocol

In this extension, students will examine the GLOBE cloud protocol to answer some key questions that connect clouds and climate. A key question includes:

- How will cloud conditions change if Earth's surface becomes warmer on average?

Protocol needed:

1. GLOBE Cloud Protocol